

AMENDMENT UNDER 37 C.F.R. § 1.111  
U.S. Application No. 09/977,297

**AMENDMENTS TO THE SPECIFICATION**

**Page 4, please replace the first full paragraph with the following amended paragraph:**

A nonlinear electronic filter is known from the publication "Adaptive Nonlinear Cancellation for High-Speed Fiber-Optic Systems", Jack Winters and S. Kasturia, Journal of Lightwave Technology, Vol. 10, No. 9, pages 971 ff. In order to reduce the time problems with the analog feedback in nonlinear filters, two threshold-value decision elements with different threshold values are connected in parallel to one another. The results of the parallel-connected threshold-value decision elements are combined by means of a controllable multiplexer. ~~The embodiment represented in Figure 7 uses two threshold-value decision elements whose outputs are connected to a multiplexer.~~ A delay flip-flop and a feedback loop connect the multiplexer of the filter. The threshold values to be set are determined by peripheral electronics. The correct determination is selected on the multiplexer in dependence on the last determined bit. Signals are equalized with such a nonlinear filter if the delays between the slow and fast signal components move within a time clock pulse.

**Page 6, please replace the ninth full paragraph with the following amended paragraph:**

A receiver 1 for optical signals is shown schematically in Fig. 2. The receiver 1 is connected to an optical transmission link 2. In the receiver 1 there is an opto-electric converter 4 which is connected to a ~~high-speed-eye monitor~~ filter 5. ~~The high-speed-eye monitor filter~~ filter 5 is

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connected, in turn, to a ~~filter~~ high-speed eye monitor 6. The output of the ~~filter~~ high-speed eye monitor 6 is connected to an electrical output line 3.

**Please replace the paragraph bridging pages 6 and 8 with the following amended paragraph:**

Fig. 3 shows an exemplary embodiment of a receiver 1 for optical signals. The electronic filter 5 - in this special case a DFE (distributed feedback equalizer)- is ~~connected~~ connected to the optical transmission link 2 and to an opto-electronic converter, not represented here. The electronic filter most commonly consists of two threshold-value decision elements connected in parallel. The outputs of the threshold-value decision elements are connected to a switch, so that the signal is sampled by either the first threshold-value decision element of the DFE or the second threshold-value decision element. The thresholds of the threshold-value decision elements can be set. However, any other adaptive system (optical PMD compensator, electronic filter) whose parameters can be set through measurement of the quality of the channel is suitable for realization of the invention. An example of a DFE is also known from DE 10015115.9, which we hereby consider as belonging to the disclosure of this application. The DFE 5 is connected to the signal output line 3. In addition, there is a connection between the DFE 5 and a first eye monitor 61 and a second eye monitor 62. The DFE 5 additionally has a control line S1 and S2 to each eye monitor respectively. The better the quality of the transmission line can be represented in the eye monitor, the better the signals decided by the DFE 5 can be measured and made available as parameters. The threshold values of the DFE can thus be set via the two eye

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monitors. The eye monitors each provide a threshold value  $V_{eye\_lower}$  and  $V_{eye\_upper}$ . These measured quantities are determined by the eye monitors. In this case, the eye monitors measure the edges of the eye opening of the signal. The parameters of the decision element in the electronic filter DFE 5 are determined through measurement of the two extreme values. Measurement at the extreme points of the eye opening improves the determination for the signal in the centre of the eye opening. Not only does such an arrangement take account of high-probability signals, but the method is also based on low-probability signals. The bit error rate is substantially improved as a result. The DFE 5 has control outputs S1 and S2 which are activated when the DFE effects the decision through  ~~$V_{th1}$  or  $V_{th2}$~~   $V_{eye\_upper}$  or  $V_{eye\_lower}$  respectively. The eye monitors operate following activation through the control signals S1 and S2. The eye monitors supply information on optimum threshold values and return it to the DFE 5.

**Page 8, please replace the second full paragraph with the following amended paragraph:**

Figure 4 shows the high-speed eye monitor ~~[[5]]~~ 6. The data input 7 is connected to three threshold-value decision elements S0, S1 and S2. The output of the threshold-value decision element S0 is the data signal line 8. The outputs of the threshold-value decision elements S1 and S2 are each connected to an EXOR circuit E1 and E2 respectively. The second input of each of the EXOR circuits E1 and E2 has a connection to the data signal line 8. The output of each of the EXOR circuits E1 and E2 is connected to an integrator I1 and I2 respectively. The outputs of the integrators are in turn each connected to an adder A1 and A2 respectively, the second input

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of which is connected to a line for setting a threshold value. On the output side, the adders A1 and A2 are connected to regulators R1 and R2. The outputs of the regulators are connected both to a further adder A3 and to the threshold-value decision elements S1 and S2, whose threshold value they set.

**Please replace the paragraph bridging pages 8 and 9 with the following amended paragraph:**

The high-speed eye monitor 6 receives the opto-electrically converted data of the converter 4 on its input signal side 7. The received data has been garbled and blurred by non-linear effects on the transmission link. This garbled data is distributed to the three threshold-value decision elements, where it is compared with a threshold value. The threshold-value decision element S0 compares the received garbled data with a reference value V0. The comparison in the threshold-value decision element S0 is influenced by a parameter C0 which is obtained from the result of the measurement of the eye height. The result at the threshold-value decision element S0 is "determined" data which, in the ideal case, corresponds to the transmitted data.